

**REPORT ON DROUGHT CONDITION
OF
PENINSULAR MALAYSIA
(BASED ON HYDROLOGIC ANALYSIS)**

August 15, 2005

**Hydrology and Water Resources Division
Department of Irrigation and Drainage
Malaysia**

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**Report of Drought Condition in Peninsular Malaysia
(Based on Hydrologic Analysis)
August 15, 2005**

Summary

1. Based on rainfall records collected from all 41 selected stations in Peninsular Malaysia for the purpose of drought monitoring, indicate that most stations have an increase amount of rainfall for the month of July (150mm) as compared to June (100.9mm).
2. But on analyzing for three month total (May, June and July), most of the stations record comparatively less rainfall as to the long term average of the three month total. 12 stations record above average while 29 others are below average. Their percentage deviation ranging from -1 to -42%. This indicates that the drought condition still persist but to a lesser extent.
3. By comparing the three month total (436.2mm) to the long term three month average (473.1mm), it can be deduced that the drought condition has nearly improved as indicated by relatively small percentage deviation of -7.8%.
4. Based on river flow analysed for the month of July 2005, four out of ten rivers being monitored on-line still experiencing low flow condition as shown in table below.

No	Name of river	Low flow reading (cubic meter)	ARI (years)
1.	Sungai Muda @ Jambatan Syed Omar	3	20
2.	Sg. Kurau @ Pondok Tanjung	1.2	> 20
3.	Sg. Kerian @ Selama	5.5	10 - 20
4.	Sg. Johor @ Rantau Panjang	2	> 20

- From six dams being monitored on-line, as on August 15, three dams still need to be closely monitored as the storage keep on decreasing as shown on table below:

No.	Name of dam being monitored	Present Storage (MCM) as on August 15	Percentage of July storage as compared to its full capacity	Percentage of present storage (15 August) as compared to its full capacity
1.	Klang Gate	17.16	63.64	60.12
2.	Machap	3.30	43.42	31.51
3.	Semberong	4.49	30.42	25.51

It shows that, the dam storages as recorded on 15 of August have reduced significantly as compared to previous month.

Drought Monitoring by Rainfall Data

- Overall, the drought condition in Peninsular Malaysia has improved quite significantly from Jun to July 2005. Based on Table 1, even though most of the rainfall stations recorded less amount of rainfall especially in the month of June with total of 100.9 mm, but wetter condition in May (total 184 mm) and July (total 151.29mm) has relieved the overall drought condition. The rainfall data is then used as input to demarcate the isohyral map as shown in Figure 1 and 2.
- Based on Table 1, 2 out of 7 rainfall stations meant for flood monitoring in Johor still recording less rainfall with its deficiency ranging from 1% to 42% of their three monthly average rainfall.
- For the state of Perlis, Kedah, Penang, Perak, Selangor, Negeri Sembilan and Pahang, the deficiency ranging from 1% to 40%. It shows that, the rainfall deficiency occurs to almost all of the West Coast states and west of Pahang. For East Coast states, especially Kelantan, Terengganu and east of Pahang, the rainfall

deficiency range from 9% to 37%, which is less severe as compared to the west coast states.

Table 1 : Rainfall Analysis for May – July 2005

(MAY - JULY 2005)

NO	NO STESEN	May-05	JUN-05	Jul-05	Total Rainfall	(3Mth Cum Rf)	Diff(mm)	% Dev
1	6501005 (R1)	190.50	98.00	64.00	352.50	583.2	-230.7	-40
2	6206035 (K1)	143.00	84.00	92.00	319.00	442.7	-123.7	-28
3	6103047 (K3)	223.00	117.90	111.00	451.90	577.8	-125.9	-22
4	061 (K4)	199.00	99.10	94.70	392.80	638.2	-245.4	-38
5	566 (K5)	209.00	123.50	74.00	406.50	650.4	-243.9	-37
6	5505033 (P1)	257.50	99.00	106.00	462.50	537.6	-75.1	-14
7	5304045 (P2)	315.00	64.00	219.50	598.50	412.1	186.4	45
8	5302003 (P3)	381.00	38.50	143.50	563.00	556.2	6.8	1
9	4109095 (A4)	103.00	70.00	200.00	373.00	351.6	21.4	6
10	4011139 (A6)	103.00	140.00	184.50	427.50	498.1	-70.6	-14
11	4011144 (A8)	119.50	144.00	112.00	375.50	558.8	-183.3	-33
12	4511111 (A12)	251.00	59.00	120.50	430.50	591.1	-160.6	-27
13	5006021 (A14)	151.00	56.00	265.50	472.50	528.5	-56.0	-11
14	5003028 (A15)	175.50	0.00	119.00	294.50	428.7	-134.2	-31
15	5210069 (A16)	85.00	85.00	80.50	250.50	371.0	-120.5	-32
16	3411017 (B3)	88.00	17.50	89.50	195.00	274.7	-79.7	-29
17	2917001 (B4)	88.50	47.50	217.00	353.00	439.4	-86.4	-20
18	2818110 (B5)	209.00	90.00	68.00	367.00	410.1	-43.1	-11
19	3516022 (B6)	232.50	85.00	87.50	405.00	583.3	-178.3	-31
20	3117070 (B7)	242.00	41.00	157.02	440.02	564.0	-123.9	-22
21	3115079 (B8)	152.00	66.00	141.00	359.00	451.6	-92.6	-21
22	2719001 (N1)	200.50	130.50	258.00	589.00	385.7	203.3	53
23	3023098 (N3)	153.00	89.00	125.50	367.50	426.8	-59.3	-14
24	2321006 (M1)	157.00	46.50	273.50	477.00	404.8	72.2	18
25	2526001 (J1)	145.00	40.00	173.00	358.00	332.9	25.1	8
26	2033001 (J2)	109.00	131.91	137.00	377.91	420.8	-42.9	-10
27	1437116 (J5)	587.00	77.00	259.00	923.00	494.0	429.0	87
28	1829001 (J7)	30.00	138.50	145.50	314.00	540.9	-226.9	-42
29	2528002 (J8)	90.00	29.00	118.00	237.00	296.0	-59.0	-20
30	2536168 (J9)	168.00	209.00	135.50	512.50	519.6	-7.1	-1
31	2527004 (J10)	132.00	66.50	143.00	341.50	400.1	-58.6	-15
32	3424081 (C3)	89.00	60.00	103.50	252.50	326.5	-74.0	-23
33	3533102 (C4)	140.00	59.50	104.50	304.00	332.9	-28.9	-9
34	4414036 (C8)	123.00	88.00	158.00	369.00	442.9	-73.9	-17
35	3930012 (C9)	237.00	221.50	224.00	682.50	600.6	81.9	14
36	4726001 (D1)	277.00	200.00	209.00	686.00	754.7	-68.7	-9
37	4819027 (D2)	335.00	159.00	185.00	679.00	591.9	87.1	15
38	5921009 (D6)	130.50	291.50	244.50	666.50	560.8	105.7	19
39	4234109 (T1)	248.00	137.00	112.00	497.00	442.8	54.2	12
40	4734079 (T2)	71.00	55.50	94.50	221.00	348.1	-127.1	-37
41	5331048 (T5)	205.00	281.00	253.00	739.00	324.8	414.2	128
	MEAN	184.0	100.9	151.29	436.2	473.1	-36.9	-7.8

MOVING 3 MONTHLY RAINFALL OF MAY – JULY 2005

MONTH : MAY 2005
PERIOD : MAC - MAY 2005

MONTH : JUNE 2005
PERIOD : APR - JUNE 2005

MONTH : JULY 2005
PERIOD : MAY - JULY 2005

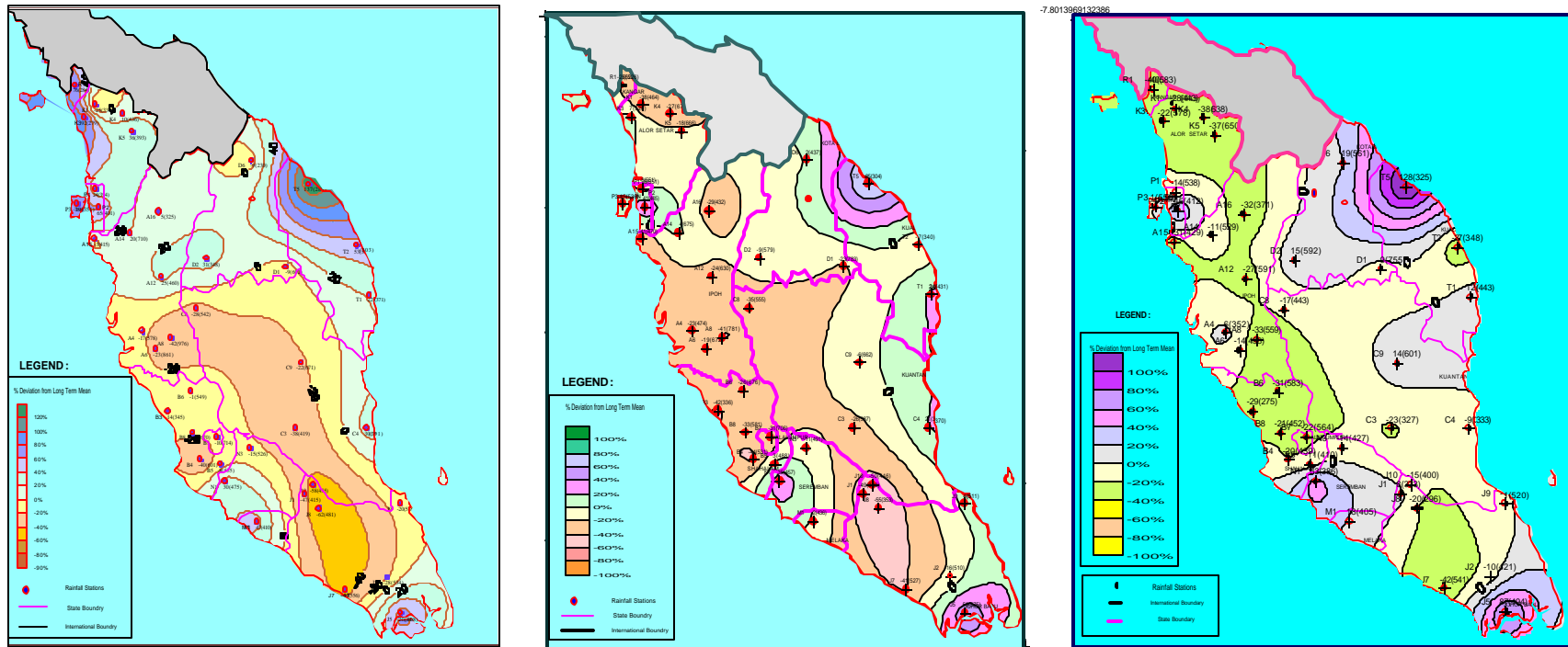


Figure 1 : Isohytal Map Showing Rainfall Deviation from Long Term Mean (May – July, 2005)

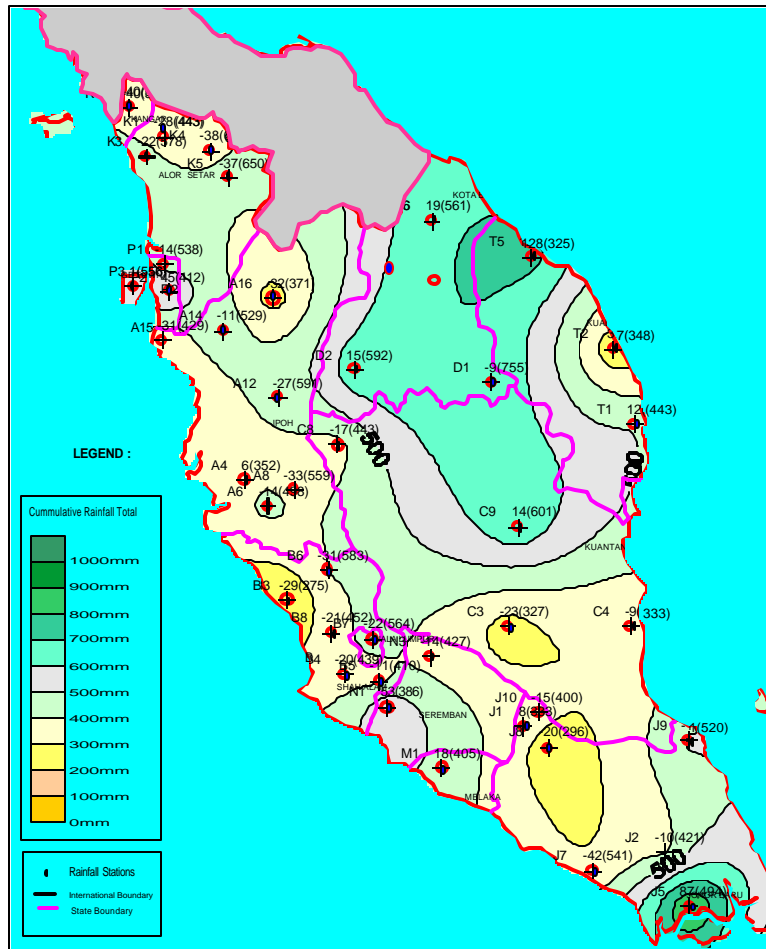


Figure 2 : Isohyet for Three Monthly Rainfall Distribution (July 2005)

Drought Monitoring by River Flow


1. Based on Table 2 and 3, as on August 15 2005, the flow of Sg. Muda at Jambatan Syed Omar, Kedah is only 3 cumecs significantly decrease from its July reading of 11 cumecs. This indicates that the drought condition still persist with an ARI of 20 years.
2. Three other rivers, namely Sg. Kelantan at Jambatan Guillerdmard, Sg. Bernam at Jambatan SKC, Sg. Kurau at Pondok Tanjung, Sg. Kerian at Selama and Sg. Johor at Rantau Panjang is experiencing drought condition ranging from 5 to 20 years ARI.

3. Table 3 shows the on-line river level reading for 10 stations extracted from the Drought Information Website as on August 15, 2005.

Table 2 : Drought Monitoring by River Flow

Station Id	Name	State	River Flow (m ³ /s)				
			April 30	May 30	June 6	July 18	Aug. 15
5721480	Sg.Kelantan @ Guillerdmard Bridge	Kelantan	83	254	245	128	102
5606480	Sg.Muda @ Syed Omar Bridge	Kedah	19	21	21	11	3
2816490	Sg.Langat @ Dengkil	Selangor	10	7	7	25	27
3813480	Sg.Bernam @ SKC Bridge	Selangor	19	16	16	13	11
4809490	Sg.Perak @ Kuala Kangsar	Perak	191	184	184	183	150
5007490	Sg.Kurau @ Pondok Tanjong	Perak	3.4	4.1	4.1	3.8	1.2
5206490	Sg.Kerian @ Selama	Perak	5.3	6.3	6.3	6.9	5.5
3424490	Sg.Pahang @ Temerloh	Pahang	258	277	277	330	187
1737490	Sg.Johor @ Rantau Panjang	Johor	5.3	3	3	18	2

Table 3 : Drought Monitoring by River Flow (on-line Infokemarau)

 JPS MALAYSIA Drought Monitoring By River Flows									
Station Id	Name	State	Last Update	Water Level (m)	River Flow (m ³ /s)	Drought Flow For Various Return Periods(m ³ /s)			
						2-year	5-year	10-year	20-year
5721480	Sg.Kelantan @ Guillerdmard Bridge	Kelantan	15/08/2005-14:01	8.37	102	154	114	88	69
5606480	Sg.Muda @ Syed Omar Bridge	Kedah	15/08/2005-14:01	6.10	3	13	8	5	3
2816490	Sg.Langat @ Dengkil	Selangor	15/08/2005-10:47	3.34	27	5	3	2	1
3813480	Sg.Bernam @ SKC Bridge	Selangor	15/08/2005-10:50	15.72	11	15	12	10	9
4809490	Sg.Perak @ Kuala Kangsar	Perak	15/08/2005-14:00	31.93	150	66	36	22	14
5007490	Sg.Kurau @ Pondok Tanjong	Perak	15/08/2005-14:01	11.50	1.2	3.4	2.4	1.9	1.5
5206490	Sg.Kerian @ Selama	Perak	15/08/2005-14:01	8.62	5.5	10.9	7.7	6.2	4.9
3424490	Sg.Pahang @ Temerloh	Pahang	15/08/2005-14:05	23.41	187	180	125	100	80
2527490	Sg.Muar @ Buluh Kasap	Johor	Off-line	1.58	-12	7.2	4.2	2.9	2.0
1737490	Sg.Johor @ Rantau Panjang	Johor	15/08/2005-13:04	2.15	2	8.5	5.5	4.2	3.2


Drought Monitoring by Dam Storage

1. From the six dams being monitored by Water Resources Unit, Hydrology and Water Resources Division, DID Malaysia as shown in Table 4 and 5, 2 dams i.e. Macap and Sembrong are still below the alert level with reading of 14.26 m and 6.30 m respectively.
2. The different between the current level with the alert level for both dams i.e. Machap and Sembrong dam are 0.86 m and 0.89 m respectively. Their remaining storages are 31.51 % and 25.51 %, lower than July 18, 2005 reading
3. The Batu, Klang Gate, Timah Tasoh and Bekok dam show an increase in level of 8.42m, 0.11m, 0.34m and 0.76m above the alert level. Table 5 shows the on-line dam monitoring in Drought Information Website on August 18, 2005.

Table 4 : Monitoring of Dam Storage Condition
(Data comparison between July 18 and Aug. 15, 2005)

Station Id	Name	State	Alert Level (m)	Water Level (m)		Remaining Dam Storage (MCM)		Remaining Dam Storage (%)	
				July 18	Aug. 15	July 18	Aug. 15	July 18	Aug. 15
3216490	Batu Dam	KL	93.00	101.66	101.42	29.74	29.24	90.39	90.83
3217480	Klang Gates Dam	KL	90.00	90.62	90.11	18.16	17.16	63.64	60.12
6602481	Timah Tasoh Dam	Perlis	27.68	28.00	28.02	19.91	20.12	60.42	61.06
1832480	Macap Dam	Johor	15.12	14.59	14.26	4.54	3.30	43.42	31.51
1931480	Sembrong Dam	Johor	7.19	6.50	6.30	5.35	4.49	30.42	25.51
2030481	Bekok Dam	Johor	12.50	13.26	13.26	30.97	30.97	97.34	97.34

Table 5 : Drought Monitoring by Dam Level
(on-line Infokemarau)

 **JPS MALAYSIA**
Drought Monitoring By Dam Levels (Under Construction)

Station Id	Name	State	Last Update	Water Level (m)	Alert Level (m)	Remaining Dam Storage (MCM)	Remaining Dam Storage (%)
3216490	Batu Dam	KL	15/08/2005-14:01	101.42	93.00	29.24	90.83
3217480	Klang Gates Dam	KL	15/08/2005-14:01	90.11	90.00	17.16	60.12
6602481	Timah Tasoh Dam	Perlis	15/08/2005-14:00	28.02	27.68	20.12	61.06
...	Bukit Merah Dam	Perak	15/08/2005-14:02	7.18	7.66	n/a	n/a
1832480	Macap Dam	Johor	15/08/2005-14:06	14.26	15.12	3.30	31.51
1931480	Sembrong Dam	Johor	11/08/2005-07:01	6.30	7.19	4.49	25.51
2030481	Bekok Dam	Johor	15/08/2005-14:00	13.26	12.50	30.97	97.34